

FEMALE LEADERSHIP IN ENGINEERING PROJECTS: CHOICE OF COURSE, CHALLENGES, IMPACTS AND ACTIONS FOR EQUITY

LIDERANÇA FEMININA EM PROJETOS DE ENGENHARIA: ESCOLHA PELO CURSO, DESAFIOS, IMPACTOS E AÇÕES PELA EQUIDADE

LIDERAZGO FEMENINO EN PROYECTOS DE INGENIERÍA: ELECCIÓN DE RUMBO, DESAFÍOS, IMPACTOS Y ACCIONES PARA LA EQUIDAD

Priscila Gisee Furukawa¹
Luana Lopes de Oliveira²
Gisele Gisee Furukawa³

Article received in August 2023

Article accepted in May 2024

DOI: 10.26853/Refas_ISSN-2359-182X_v11n01_08

ABSTRACT

In the current scenario, gender equity in organizations has been increasingly discussed and translated into corporative actions. This paper had as general objective to know and provide information about the challenges of female leaders in Engineering projects, capturing their vision of the impacts of female leadership in the formation of new leaders, addressing the education aspect regarding choosing the Engineering course and to understand which actions should be taken by the companies to ensure gender equality and female representativeness. This research began with a bibliographical survey on the subject and descriptive research in interviews format was conducted with eleven women who are or have been

¹ Graduated from Universidade Federal Fluminense (UFF), postgraduate in Project Management from USP-ESALQ. E-mail: priscilafurukawa@gmail.com. Lattes: <http://lattes.cnpq.br/0881044063940597>. OrcId: <https://orcid.org/0009-0005-0646-3975>.

² Academic PhD in Administration from ESPM, academic master's degree in Administration from PUC-SP, MBA in Controllership and Finance from USP and MBA in Project and Process Management from UNESP. Professor of Project Management, People Management, Strategic Business and Market Management and Digital Management and Transformation at UNIP, Saint Paul, USP/Esalq/Pecege, USP EACH and ECA/USP. E-mail: doutoraluanasuerte@gmail.com. Lattes: <http://lattes.cnpq.br/2049777160264346>. OrcId: <https://orcid.org/0000-0003-4401-276X>.

³ Geologist, graduated from the Federal University of Rio de Janeiro. Postgraduate degree in Geology (Master's) in progress, from the Federal University of Rio de Janeiro. E-mail: giselegeologiarj@gmail.com. Lattes: <https://lattes.cnpq.br/1401413451765565>. OrcId: <https://orcid.org/0009-0003-5794-8871>.

in leadership positions in Engineering projects. The results showed that the greatest challenges for women who have reached these positions are strongly related to the issue of prejudice and gender stereotypes, factors that also interfere with their choice for Engineering course. This demonstrates that there is still a long way to go to achieve this equality. Taking a look into the future, creating an egalitarian culture is necessary and is listed among the main actions described by the interviewees. In addition, the balance of benefits and responsibilities between men and women during motherhood and, especially, the generation of representativeness will ensure a more balanced environment and the emergence of new female leaders.

Keywords: Women in engineering; Gender equity; Female representativeness; Women in management.

RESUMO

No cenário atual, a equidade de gênero nas organizações tem sido cada vez mais discutida e traduzida em ações corporativas. Este trabalho teve como objetivos conhecer e apresentar os desafios da mulher líder de projetos de Engenharia, captando o seu entendimento sobre os impactos da liderança feminina na formação de novas líderes, abordar o aspecto da educação e sua relação na escolha pelo curso de Engenharia e compreender as ações que as empresas devem buscar para assegurar equidade de gênero e representatividade. Esta pesquisa se iniciou com o levantamento bibliográfico acerca do tema e uma pesquisa descritiva em formato de entrevistas foi realizada com 11 mulheres que estão ou já estiveram em posições de liderança de projetos de Engenharia. Os resultados obtidos apontaram que os maiores desafios das mulheres que alcançaram estes cargos estão fortemente relacionados à questão do preconceito e dos estereótipos de gênero, fatores esses que também interferem em sua escolha pelo curso de Engenharia. Isto demonstra que ainda existe um longo caminho a ser trilhado para que seja possível conquistar esta igualdade. Um olhar para o futuro em busca da criação de uma cultura igualitária se faz necessário e está elencada entre as principais ações descritas pelas entrevistadas. Além disso, o equilíbrio dos benefícios e das responsabilidades entre homens e mulheres durante a maternidade e, principalmente, a geração de representatividade poderão assegurar um ambiente mais balanceado e o surgimento de novas líderes.

Palavras-chave: Mulheres na engenharia; Igualdade de gênero; Representatividade feminina; Mulheres na gestão.

RESUMEN

En el escenario actual, la equidad de género en las organizaciones ha sido cada vez más discutida y traducida en acciones corporativas. Este trabajo tuvo como objetivo general conocer y presentar los desafíos de la mujer líder de proyectos de Ingeniería, captando su comprensión sobre los impactos del liderazgo femenino en la formación de nuevos líderes, abordando el aspecto de la educación y su relación en la elección por la Ingeniería. curso y comprender las acciones que las empresas deben buscar para garantizar la igualdad y representación de género. Esta investigación se inició con un levantamiento bibliográfico sobre el tema y se realizó una investigación descriptiva en forma de entrevistas a 11 mujeres que están o han estado en posiciones de liderazgo en proyectos de Ingeniería. Los resultados obtenidos indicaron que los mayores desafíos para las mujeres que alcanzaron estos cargos están fuertemente relacionados con el tema de los prejuicios y estereotipos de género, factores que también interfieren en su elección por la carrera de Ingeniería. Esto demuestra que todavía queda un largo camino por recorrer para lograr esta igualdad. Una mirada al futuro en busca de la creación de una cultura igualitaria es necesaria y figura entre las principales acciones descritas por los entrevistados. Además, el equilibrio de beneficios y responsabilidades entre hombres y mujeres durante la maternidad y, principalmente, la generación de representatividad garantizará un entorno más equilibrado y el surgimiento de nuevos líderes.

Palabras clave: Mujeres en la ingeniería; Igualdad de género; Representación femenina; Mujeres en la gerencia.

1 INTRODUCTION

Discussions about gender equity are increasingly on the agenda these days, especially with the term Environmental, Social and Governance [ESG], which corresponds to the environmental, social and governance practices of an organization (Global Compact, 2022), gaining great visibility in Brazil. Companies with strategic alignment with ESG become more competitive in the domestic and foreign markets in terms of solidity, good reputation, low costs and greater stability amid the vulnerabilities and uncertainties of the current market (Global Compact, 2022). Also according to the Global Compact (2022), among the ESG sustainable development objectives, gender equality ranks fifth. In this way, companies with actions related to increasing the proportion of women in senior management are more attractive to both customers and employees.

In the latest information on gender statistics issued by the Brazilian Institute of Geography and Statistics [IBGE], carried out in 2019 and published in 2021, it is noted that, although women are still a minority in the workforce, with 54.5% of its population versus 73.7% of the male population, the lower salaries and the difficulties encountered by them cannot be attributed to education. It was shown by the National Household Sample Survey [PNAD] Contínua 2019 that women were more educated than men, especially with regard to the population in the group between 25 and 34 years old, in which 25.1% of women had completed higher education, against 18.3% of men. Despite the percentage of women enrolled in higher education, statistical data indicate that only 21.6% of these women choose Engineering courses and related professions, which may be related to the low participation of women in project management positions linked to Engineering. Although the number of female engineers is increasing over the years, the number of women registered in the technological areas of the Federal Council of Engineering and Agronomy [CONFEA] and Regional Council of Engineering and Agronomy [CREA] between the years 2020 and 2021 corresponds just 19.3% of the total (CONFEA, 2021).

According to the 2020 Project Management Institute [PMI], organizations that offer or finance gender equity programs are more often associated with high performance and return on investment, as clients want to see themselves reflected in companies' project teams. A diverse team generates more empathy by bringing together a combination of different perspectives to understand what end users really want in a project. According to Barney (1991), companies gain competitiveness by creating value on important, rare and non-substitutable resources, such as people. In relation to women in leadership positions, Grant Thornton (2022) reported that there has been an 11% increase in the number of women leaders in the last 10 years. However, even with all the positive aspects surrounding the search for equity, the total number of women reached just 32%. With the change in the profile of corporations regarding diversity, a study carried out in 2020 by McKinsey & Company shows that employees of companies that have adopted actions to increase diversity have higher levels of innovation and collaboration and the levels of commitment of these companies are directly related to their leaders' ability to create reliable, high-performance teams. The study also reveals that your female or other employees are 12% more likely to want to move up to the next hierarchical level in your organization compared to their peers at other companies.

Considering the points presented, this research aims to understand and present the challenges of women in Engineering, with regard to the impacts of female leadership on the conception of new leaders and their relationship with the choice of the Engineering course. Furthermore, we seek to understand the actions to be pursued by companies in order to guarantee gender equity and representation in these positions.

2 THEORETICAL BACKGROUND

Baker et al. (2023) pointed out that having women in management positions is linked to an increase in the hiring of female managers as well as appointments and promotions driving equality and diversity processes, especially in male-dominated sectors. Creating a parallel with the theme of diversity and the current responsibility of the professional who has sought a balance between professional and personal life, the female management profile today appears to be fully aligned with current needs as it has a broad ability to multitask and has a systemic vision. , flexibility and, above all, ability to manage people, perceiving them as part of a whole (Kuchak et al., 2021).

Oliveira-Silva and Parreira (2022) pointed out the unfriendly environment, harassment, gender discrimination, prejudices and stereotypes and difficulty in moving up in the area as some barriers to women's entry into predominantly male careers. Furthermore, Lombardi (2006) found in her study that women suffer resistance mainly in more operational activities, starting with the construction segment. This reinforces that the great challenge for women engineers is to break prejudices about their participation in external activities that are considered heavy and manual and in leadership positions, as both men and women remain equal in intellectual capacity (Oliveira, 2017).

Women are also constantly called stressed or emotionally unstable, creating a lack of credibility. However, most of these reactions occur due to the hostile environment in which they find themselves, in which they constantly need to show that they deserve the place they have achieved (Instituto de Engenharia, 2019).

3 METHOD

This work has been developed using bibliographic and descriptive research methods. The first phase was dedicated to bibliographical research for theoretical basis and survey of hypotheses on the topic of female leadership in Engineering. Books, dissertations, articles and reports were used as data sources, in order to contribute statistics, concepts and understanding on the topic to support data collection and analysis.

The second phase was dedicated to descriptive research, which aims to describe the characteristics of a given population, phenomenon or establishment of relationships between variables (Maia, 2020). The method used was a field study carried out using a form, which differs from a questionnaire in that it is a collection of questions that are asked and noted down by an interviewer in a face-to-face situation with the interviewee (Maia, 2020). The interview script consisted of 11 questions, two closed and nine open, according to Appendix A, prepared based on the theoretical content. Data collection took place in the form of interviews that were carried out in person and via telephone, lasting an average of between 25 and 40 minutes, between March and April 2023.

The research had as its backdrop companies in the oil and gas, energy, beverages, automotive and fashion and luxury segments and, as it is a research aimed at female management in Engineering projects, its target population was women who are or have been, at some point in their careers, in the position of engineering project leaders. The sample consisted of 11 women and the results are not intended to be extrapolated as it is not a

representative sample. The segments and description of the interviewees' performance as leaders are included in Table 1.

Table 1 - List of leader segments and operations

Segment	Description of work as project leader
Oil and gas	New gas pipeline construction project and reception point
Oil and gas	Gas transportation operation insourcing project
Oil and gas	Civil engineering projects on oil platforms
Oil and gas	Certification and quality projects, related to Equipment Inspection Service Certification [SPIE] in accordance with NR-13
Oil and gas	Engineering Projects
Energy	Project that aimed to put two synchronous compensators into commercial operations
Energy	Reinforcement and improvement projects in the electrical sector
Energy	Energy auction study projects
Beverages	Civil construction projects for new distribution centers
Automotive	Implementation projects in product development engineering in the area of vehicle safety
Fashion and luxury	Implementation projects in product development engineering in the area of vehicle safety

Source: Original research data

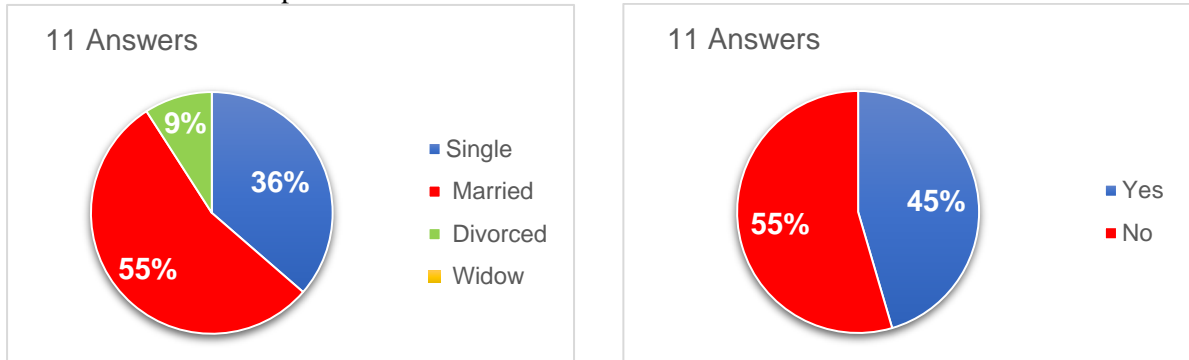
The approach used for data analysis was qualitative, in order to seek a deeper understanding of the phenomena studied, interpreting them from the perspective of the subject who participates in the situation without worrying about statistical generalizations and numerical representation (Guerra, 2014).

4 RESULTS AND DISCUSSION

As described in the Materials and Methods stage, interviews were carried out with 11 Engineering project leaders in order to collect information about their experience as managers and use it to test some hypotheses described in the introduction. To understand some

characteristics of the sample, the first two questions were related to marital status and family composition and the question of having children. Of the sample studied, 55% of the women were married and 55% did not have children, while 45% did, as shown in Graphs 1 and 2.

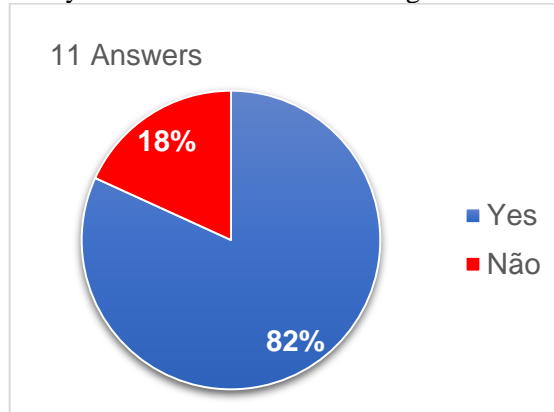
Graphs 1 and 2 – Marital status and information about children



Source: Original research data

The next question in the questionnaire aimed to address the relationship between personal and professional life and 82% of respondents responded that they found it difficult to reconcile these areas, as shown in Graph 3.

Graph 3 - Survey on difficulties in reconciling career and personal life



Source: Original research data

It has been pointed out in the interviews that women tend to have difficulty managing all the roles they assume, often placing themselves as leaders and protagonists in the role of mother, wife and professional, which leads to overload, when domestic tasks could be shared with partners. For Leme (2020), shared responsibility is of great importance for women's career advancement and, although many partners provide support and support to their children, there are still doubts about roles and obligations. Duong and Skitmore (2003) complement this understanding that the balance between family and work is a challenge for women managers, however, they state that fathers spend more time with the family, while mothers invest more in work and suggest that the policy support during motherhood should be extended to men.

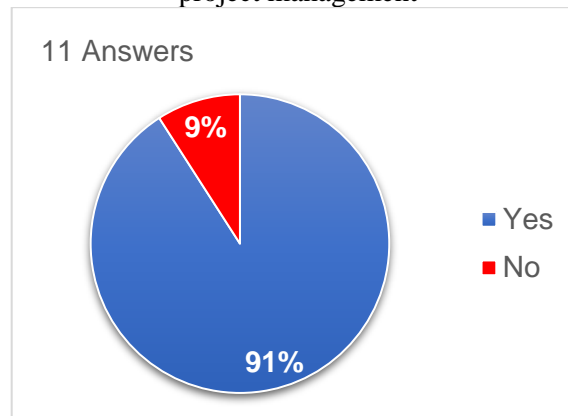
The issue of motherhood was addressed in the responses as a relevant component of this imbalance, since in the first months of a child's life the attribution of mother can hardly be replaced. In fact, this is a decisive factor and women give up or accept a slower career progression when they want to be mothers. Various arrangements were found in search of a

balance between professional and personal life (Lombardi, 2006), but even so, some engineers choose to postpone or renounce motherhood and even not to get married due to their career. According to Salvagni and Canabarro (2015), it is noticeable that in organizations there is still no environment that allows for dialogue between motherhood and career.

A small portion of those interviewed responded that they did not find it difficult to reconcile the two environments, as there is greater flexibility in work through the hybrid system. According to Boonen (2002), the presence of workers at home can be advantageous, as it brings them closer to their family, making it easier to monitor their children's education or provide assistance to family members. The differences in employee health when working from home are significant (Gonçalves et al., 2018).

The next block of questions aimed to understand the impacts of the existence of women in leadership positions and their relationship with the current profile of professionals who seek a balance between professional and personal life. Regarding leadership styles, 91% of respondents described that the female leadership style is aligned with current needs in Engineering projects, as shown in Graph 4.

Graph 4 - Understanding the female leadership profile is aligned with the current needs of engineering project management



Source: Original research data

According to the interviewees, there are some factors, both behavioral and related to professional qualifications, that demonstrate full alignment of the female profile with current management needs. Regarding behavioral aspects, the female leader has a multitasking and generalist profile. In general, she is more attentive to details, not only in the work itself, but also in caring for her employees, treating them empathetically and understanding personal issues more easily. Spector (2010) described the fact that women care more about the feelings and well-being of their subordinates as a characteristic of women, while men focus on completing activities. For Buckle and Thomas (2003), the term feminine reflects more fluid and responsive attitudes, being more sensitive to the expectations of customers and employees, dealing better with emergencies and setting more flexible goals for their team. Additionally, according to one of the interviewees, women have greater flexibility to deal with various needs in both the professional and personal areas of their lives, which can also represent a challenge due to the physical and mental overload they suffer due to the many demands. professional and personal and social pressure.

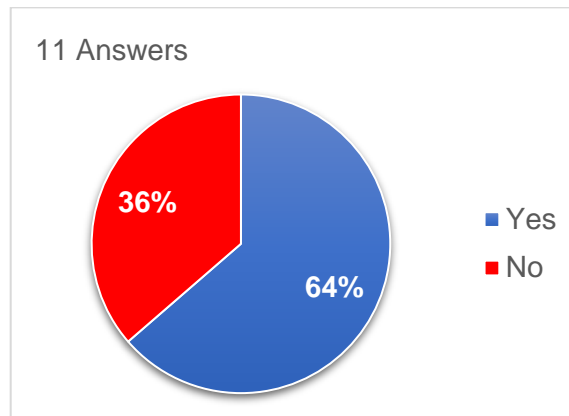
Related to the professional aspect, the interviewees responded that, in some cases, female leaders need to be more qualified than men to compete for these positions on an equal

basis, which makes them more technically qualified to take on certain roles. For Leme (2020), women always need to be prepared to reinforce their training and even then they doubt whether they are capable. Oliveira-Silva and Parreira (2022) mention insecurity and questioning one's own competence as some of the sensations felt by professionals.

The term labyrinth, described by Carli and Eagly (2016), is the most common metaphor interpreted by female leaders, because, despite the slow improvement in women's access to these positions, they continue to face challenges that men in the same occupation do not face, such as gender stereotypes that place women as unfit to lead, discrimination in salaries and promotions, and lack of access to important networks and mentors.

The next question aimed to understand whether, in the interviewees' view, there are greater difficulties in reaching leadership positions when there are no other women in their hierarchical structure. For 64% of those interviewed, the understanding is that there are difficulties when there are no other women to support professional growth, while 36% understand that there are other factors that hinder the growth of women within organizations, as shown in Graph 5.

Graph 5 - Perceptions about the career development relationship and the existence of other women in the hierarchical structure



Source: Original research data

For those interviewed who answered yes, women in leadership positions act as facilitators of the progression process of other women, due to the understanding that there are no differences between men and women with regard to these activities and the factor of representation that acts in a to break down prejudices in decision-making in a selection process. They describe that there is discomfort among some men in having female partners in the professional environment and this reflects the need to prove themselves more capable and prepared than men in these roles. This fact does not occur when there is a woman in a leadership position or distributed in the hierarchical structures of these organizations. These responses contribute to the study by Backer et al. (2023), in which the existence of a strongly positive relationship was pointed out between the existence of female managers and the appointment of other women to managerial positions. It is noteworthy that the greater the incidence of women in these positions, the more examples there will be and the more female professionals will be able to see the possibility of reaching higher positions.

Contrasting this assessment, the remaining 36% of the sample responded that they understood that the existence of women in the hierarchy does not facilitate the evolution of

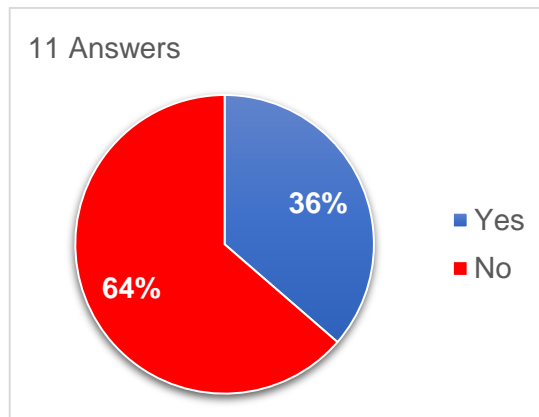
others and attributed the difficulty of reaching these positions to the well-known glass ceiling. The glass ceiling is characterized by a social phenomenon that, based on cultural, organizational, family and individual barriers, makes it difficult for women to access leadership positions, with its main factors associated with prejudice, diversity, difficulty in reconciling personal and professional roles, low trust, among others (Carneiro, 2018).

One of the interviewees mentioned that she considers Brazilian society to be sexist and that this characteristic comes from both men and women, contributing to the studies by Reuben et al. (2013), who suggest that both genders discriminate against women without realizing it. Duong and Skitmore (2003) also agree that the discriminatory culture against women is a fact, however, when it comes to support within project management, males tend to provide more support to their female counterparts than the opposite, even in competitions with limited opportunities.

Arvate et al. (2018) showed that, in public organizations, where leaders are elected by vote, women are usually reelected and act with asymmetrical power and discreet decisions. The authors found that leaders make favorable decisions in relation to their subordinates and propose replacing the term queen bee, which refers to a tendency for leaders to be more critical of women in lower positions, with real leader.

The next question aimed to understand whether, despite women being more educated than men, the low choice of Engineering courses is directly linked to the low prospect of career progression. Of the interviewees, 64% understand that it is not, while 36% of them believe that a scenario with little evolution influences the choice of the course, as shown in Graph 6.

Graph 6 - Relationship between choosing an Engineering course and the prospect of career progression



Source: Original research data

Most interviewees understand that there are other barriers that make it difficult for women to enter Engineering courses, including cultural and social issues, such as gender prejudices and stereotypes that women should be dedicated to caring for others. One of the interviewees described her experience in choosing the Engineering course. She revealed that she has always been fascinated by the Physics and Mathematics subjects, but that she never thought about or received the suggestion of studying Engineering. However, there was encouragement for her to choose the Physics course, in order to become a teacher.

Researching more about its theory and application, he initially identified with the Mechanical Engineering course. This contributes to the fact that women tend or are directed to choose the areas of Human Sciences and Linguistics. According to Makarova et al. (2019), gender stereotypes surrounding the areas of Mathematics and Science can potentially influence the aspirations of women and men when choosing to enroll in a Science, Technology, Engineering & Math [STEM] course, which corresponds to Science, Technology, Engineering and Mathematics, at the university. They add that a less pronounced masculine image can increase the probability of obtaining higher levels of diversity in these courses.

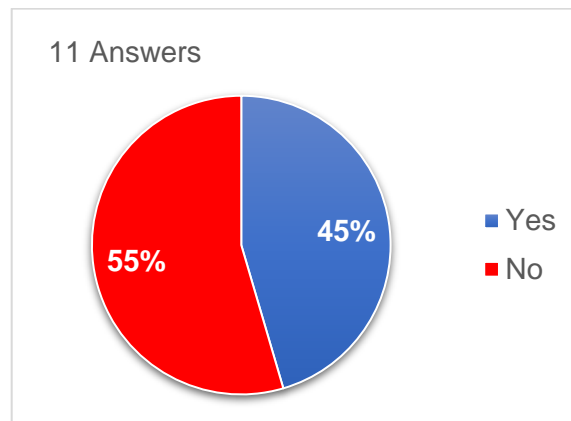
So, opting for an Engineering course means overcoming limitations in the female world, as women learn from an early age that they are poorly gifted for abstract reasoning, for dealing with the world of production, for leadership and for decision-making (Saraiva, 2005). Although there are no legal prohibitions on female entry into Engineering, the discourses that place women as debtors of attributes encourage a subjective barrier (Saraiva, 2005), the aforementioned glass ceiling. This obstacle becomes more difficult to overcome than the prohibitions that occurred in the 1970s, which were explicit to women when entering higher education and the job market, the so-called concrete wall (UNRISD, 2017).

The other women who answered yes to the question understand that the possible stagnation and difficulty in career progression in these areas is a factor that can determine the choice of course. One of the interviewees understands that opportunities are not equal for men and women and this can represent a difficulty not only in career progression, but also in women's entry into this market. For this reason, he does not recommend that his daughters study Engineering. Another interviewee understands that there can be career stagnation due to the lack of opportunities and unfair competition with male colleagues for higher positions. It is noted that, without any information other than a candidate's appearance (which makes gender clear), male and female individuals are twice as likely to hire a man than a woman (Reuben et al., 2013). According to Carvalho and Sobreira (2008), the job market continues to discourage future female engineers, as they know that they will not have the same opportunities as male engineers due to the greater appreciation of male work and the attribution of hierarchical values and salaries for men and women.

Still according to the same authors, the plurality of models of both genders must be appreciated, as well as combating traditional standards, as these encourage discrimination and prejudice between men and women in activities related to STEM, in addition to encouraging relationships of power that are based on gender stereotypes and not on professional performance and competence.

Considering the whole issue of gender stereotypes and prejudice raised in the previous questions, the next question sought to understand whether the interviewees consider the existence of difficulties in career development as a result of the prejudice they experience in operational and field activities. The responses were quite polarized, with 55% of those interviewed responding that their careers had not been impacted by this difficulty while 45% indicated that they had, as shown in Graph 7.

Graph 7 - Relationship between career development difficulties and technical/operational knowledge



Source: Original research data

Respondents who did not indicate lack of opportunity in operational positions as an issue understand that the difficulty of progression is related to cultural factors related to the need for women to prove themselves more capable and prepared than men. Others have not experienced this difficulty and understand that their technical qualifications have always been recognized regardless of gender. For those interviewed who responded positively, they point out, among some factors, the view of the weaker sex, the unfriendly environment and the inadequate structures of field facilities as obstacles to female participation in these spaces. In Civil Engineering, especially on the construction site, one is faced with a masculine environment in many aspects, where many women aspiring to Engineering are negatively influenced due to this sexist context that the area still has, which can be a great discouragement (Silva et al., 2020).

Others also consider motherhood as a complication when accepting positions in the field, as it is often necessary to be away from their children to experience the day-to-day activities of these activities. Although the result of this question presents a clear division of opinions regarding the understanding of the impact of discrimination in operational areas on the professional development of women, everyone understands that there are daily challenges that women need to face to rise to the leadership of these projects.

Question 10 was directed to the biggest barriers encountered by these women as managers of Engineering projects. All those interviewed understand that the biggest difficulty comes from prejudice due to the machismo that permeates our society and operates mainly in companies with a history of male domination. The interviewees cite as one of the barriers the need to prove themselves more competent and capable than a man would need to do in the same position. Tavares and Moreira (2022) state that women, in the search for better work opportunities and appreciation, need to assert themselves in front of the male group so that they are respected, whether by colleagues at the same hierarchical level or even by subordinates. They mentioned the existence of an initial prejudice, especially from older colleagues, in accepting that a woman can fulfill a technical role as well as a man.

In terms of relationships, the interfaces between different hierarchical levels also generate great difficulty due to the feminine word being frequently discredited in spaces for discussion and decision-making. Microaggressions occur daily as acts of female silencing, including: maintainrupting, which occurs when a man interrupts a woman without her concluding what she is saying, making her speech less valid or disregarded, and mansplaining, when a man explains something that is obvious to that woman, which can lead to a decrease in

self-esteem and self-confidence, as well as invalidating the woman's knowledge of other people and herself (Instituto Brasileiro de Análise do Comportamento [IBAC], 2022).

Added to this, the lack of flexibility in the work environment is an obstacle to the search for qualifications, hindering female advancement due to the simultaneous professional and family journey. This makes competition with men for leadership positions unequal. All of these behaviors described indicate that, in many companies, there is still a great persistence of hegemonic masculinity, characterized by the requirement that everyone must ideologically legitimize the global subordination of women to men (Connell; Messerschmidt, 2013).

The last question in the questionnaire aimed to identify what actions these women understand that companies should pursue to ensure gender equity in Engineering and representation in these positions. In this sense, a study that presented measures that companies should take to attract a diverse team highlighted three recommendations: demonstrate a demand for women's leadership skills; understand what drives the desire for leadership; and create an environment that supports women's desire to lead (UN Women, 2021).

In order to contribute to these recommendations, the interviewees also highlighted the need to create career development programs aimed at women to train and train new leaders. It is common for companies to look for women who already have a history of leadership in their career for their leadership positions. However, statistics reveal that the number of women with this experience is limited (IBGE, 2021). Therefore, it is important for companies to invest in training new leaders. This action has the consequence of generating more representation with the insertion of women in various leadership positions such as directors and administrative councils.

In conjunction with these programs, the organization's culture must also be worked on in order to eliminate prejudices and gender stereotypes, starting with the leaders, as their profile directly reflects on the behavior and performance of their respective teams.

The creation of diversity councils to guide the company's senior management is also an important step in initiating a new corporate culture, since strengthening the participation of women in collegiate bodies can express different points of view and experiences and contribute to leadership. more effective. Subsequently, expanding the understanding of concepts and aligning internal diversity policies with the establishment of inclusion goals complete the necessary cycle of corporate actions.

Finally, the last, but not least, actions are related to the issue of balance between personal and professional. Increasing flexibility and care for professional women during maternity, as well as establishing a balance of benefits between men and women, for example, maternity and paternity leave with similar periods, are actions responsible for ensuring the continuity of more and more women in the market after maternity.

All of these actions can build a strong business culture and bring many competitive advantages to companies of all sizes, in addition to helping to develop human capital and brand positioning in the market, showing its difference from the competition.

5 FINAL CONSIDERATIONS

Engineering is an area traditionally dominated by men and, even though there is an increase in female strength in companies in this segment, this does not mean that there is representation, since female participation in leadership of these projects is still discreet. Based on this, this work aimed to highlight and discuss the issues surrounding female participation and advancement in engineering project management, across the spectrum of women who are or have been in leadership in this sector. Understanding the challenges allows us to look to the future in terms of institutional policies that encourage the professional development of women in order to match the presence and performance of men.

Analyzing the results of this research, it was observed that the biggest challenges facing women in engineering project management positions are still related to discrimination and gender stereotypes that have persisted from past times to the present, limiting female performance to dedication to family in order to stay away from masculine spaces such as the construction site and operational areas. It was identified that these stereotypes can even interfere with women's choice of Engineering courses, a fact that also justifies the low percentage of women enrolled in these courses, even though statistics show them to be more educated than the male public.

To overcome these challenges, it is important that organizations act on gender equity, not only in the theoretical aspect, but also in a genuine way to build a new culture, as it is already known that these actions are directly related to employee satisfaction, as well as well as the financial return of organizations and the way they are seen by customers and the market. Setting inclusion goals through the development of career development programs is one of the strategies to enable and insert women at different hierarchical levels in an organized and competent way, ensuring not only representation, but teams with varied ideas.

It is essential that society as a whole understands the relevance of this topic and acts legitimately to break down the barriers that prevent gender equality from being achieved in all spaces. With all the technological advances that act to mechanize processes and increasingly reduce the need for physical strength in the operational environment, believing that there is a difference between men and women, in terms of intellectual and emotional capacity, represents a major setback and becomes hopes that this work will contribute positively to expanding these discussions.

6 REFERENCES

ARVATE, P. R.; WALCZAK, G.; TODESCAT, I. **The queen bee: a myth? The effect of top-level female leadership on subordinate females.** *The Leadership Quarterly* v29, n.5, p. 533-548, 2018. DOI: <https://doi.org/10.1016/j.leaqua.2018.03.002>. Disponível em: <https://www.sciencedirect.com/science/article/abs/pii/S1048984317305179>. Acesso em: 01 abr.2023.

BACKER, M.; ALI, M.; FRENCH, E. **Investigating how women leaders and managers support other women's entrance and advancement in construction and engineering.** *Journal of Construction and Engineering* v149 n.2, p. 1-43, 2023. DOI:

<https://doi.org/10.1061/JCEMD4.COENG-12399>. Disponível em: <https://ascelibrary.org/doi/abs/10.1061/JCEMD4.COENG-12399>. Acesso em: 28 mar.2023.

BARNEY, J. **Firm Resources and Sustained Competitive Advantage**. Journal of Management v17, p. 99-120, 1991. DOI: <https://doi.org/10.1177/014920639101700108>. Disponível em: <https://journals.sagepub.com/doi/10.1177/014920639101700108>. Acesso em 15 mar.2023.

BOONEN, E. M. **As várias faces do teletrabalho**. Revista Economia & Gestão v2 n. 4, p. 106-207, 2002. Disponível em: <https://periodicos.pucminas.br/index.php/economiaegestao/article/view/104/97>. Acesso em: 03 mar.2023.

BUCKLE, P.; THOMAS, J. **Deconstructing project management: a gender analysis of project management guidelines**. International Journal of Project Management v21, p. 433-441, 2023. DOI: [https://doi.org/10.1016/S0263-7863\(02\)00114-X](https://doi.org/10.1016/S0263-7863(02)00114-X). Disponível em: <https://www.sciencedirect.com/science/article/abs/pii/S026378630200114X>. Acesso em: 06 mar.2023.

CARLI, L.L.; EAGLY, A.H. **Women face a labyrinth: an examination of metaphors for women leaders**. Gender in Management 31 (8): 514-527, 2016. Disponível em: <https://www.emerald.com/insight/content/doi/10.1108/GM-02-2015-0007/full/html>. Acesso em 07 abr.2023.

CARNEIRO, L.B. **Teto de vidro: um estudo sobre os fatores deste fenômeno no Brasil sob a percepção das mulheres gestoras**. Dissertação de Mestrado em Administração. Instituto de Ciências Econômicas, Administrativas e Contábeis, Universidade Federal do Rio Grande, Rio Grande, 2018.

CARVALHO, M.G.C.; SOBREIRA, J.L. **Gênero nos cursos de engenharia de uma universidade tecnológica brasileira**. ARBOR Ciencia, Pensamiento Y Cultura. V 184 n.733, p. 889-904, 2008. Disponível em: <https://arbor.revistas.csic.es/index.php/arvor/article/download/232/233/233> Acesso em 17 abr.2023.

CONNELL, R.W.; MESSERSCHMIDT, J.W. **Masculinidade hegemônica: repensando o conceito**. Estudos Feministas v21 n.1. p. 241-282, 2013. DOI: <https://doi.org/10.1590/S0104-026X2013000100014>. Disponível em: <https://www.scielo.br/j/ref/a/cPBKdXV63LVw75GrVvH39NC>. Acesso em: 20 abr.2023.

CONSELHO FEDERAL DE ENGENHARIA E AGRONOMIA [CONFEA]/Conselho Regional de Engenharia e Agronomia [CREA] E MÚTUA – **Mulheres no Sistema**. Disponível em: <https://www.programamulherconfea.com/mulheresnosistema>. Acesso em 21 mar.2023.

DUONG, T.T.; SKITMORE, M. **Women project managers' workplace problems: a survey**. Journal of Women and Minorities in Science and Engineering v9 n.2. p. 1-29, 2003. DOI: 10.1615/JWomenMinorScienEng.v9.i2.50. Disponível em: https://www.researchgate.net/publication/27465326_Female_project_managers'_workplace_problems_a_survey. Acesso em: 03 fev.2023.

GONÇALVES, M.C.B.; ALMEIDA, T.C.; MOURA, V.F.M. **Qualidade de vida no trabalho e métodos flexíveis de trabalho: uma análise multimétodo sobre o impacto do home office na qualidade de vida no trabalho do colaborador**. Revista Linceu On-Line 8 (2): 74-94, 2018. Disponível em https://liceu.fecap.br/LICEU_ON-LINE/article/view/1797/1049. Acesso em 18 abr. 2022.

GRANT THORNTON BRASIL. **Women in business 2022**. Disponível em: <<https://www.grantthornton.com.br/insights/artigos-e-publicacoes/women-in-business-2022/>>. Acesso em 15 abr. 2022.

GUERRA, E.L.A. 2014. **Manual de pesquisa qualitativa**. 1ed. Belo Horizonte: Editora Grupo Ânima Educação, 2014.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA [IBGE]. **Relatório estatísticas de gênero – indicadores sociais das mulheres no Brasil**. Disponível em: <https://biblioteca.ibge.gov.br/visualizacao/livros/liv101784_informativo.pdf> Acesso em 17 abr.2022.

INSTITUTO BRASILIENSE DE ANÁLISE DO COMPORTAMENTO [IBAC]. 2022. **Gaslighting, mansplaining, maninterrupting, bropropriating E manspreading: uma visão analítico-comportamental**. Disponível em: <[https://ibac.com.br/gaslighting-mansplaining-maninterrupting-bropriating-e-manspreading-uma-visao-analitico-comportamental/#:~:text=Mansplaining%3A%20Quando%20um%20homem%20explica,ela%20mesma%20\(por%20exemplo%2C%20um](https://ibac.com.br/gaslighting-mansplaining-maninterrupting-bropriating-e-manspreading-uma-visao-analitico-comportamental/#:~:text=Mansplaining%3A%20Quando%20um%20homem%20explica,ela%20mesma%20(por%20exemplo%2C%20um)>. Acesso em 04 abr.2023.

INSTITUTO DE ENGENHARIA. 2019. **O que Leva uma Mulher a Desistir da Carreira de Engenharia?** Disponível em: <<https://www.institutodeengenharia.org.br/site/2019/04/10/o-que-leva-uma-mulher-a-desistir-da-carreira-na-engenharia/>> Acesso em 22 mar.2023.

KUCHAK, M; ROCHA, G; ROCHA, P. **Estilos de liderança feminina nas organizações: uma revisão da literatura**. Revista Livre de Sustentabilidade e Empreendedorismo v6. n.1. p. 61-71, 2019. Disponível em: <https://www.relise.eco.br/index.php/relise/article/view/349/500>. Acesso em: 07 mar.2023.

LEME, V.C.O. **Liderança feminina nas organizações: contribuições da gestão de projetos**. Dissertação de Mestrado em Administração. Programa de Pós-graduação em Gestão de Projetos. Universidade Nove de Julho – UNINOVE, São Paulo, 2020.

LOMBARDI, M.R. **Engenheiras brasileiras: inserção e limites de gênero no campo profissional**. Cadernos de Pesquisa v36 n.127. p. 173-202, 2006. Disponível em: <https://www.scielo.br/j/cp/a/YC58w98m3kPZnzFCGDhxzWj/?format=pdf&lang=pt>. Acesso em: 28 jan.2023.

MAIA, A.C.B. **Questionário e entrevista na pesquisa qualitativa: elaboração, aplicação e análise de conteúdo**. 1ed. São Carlos: Editora Pedro e João, 2020.

MAKAROVA, E.; AESCHLIMANN, B.; HERZOG, W. **The gender gap in STEM fields: the impact of the gender stereotype of math and science on secondary students' career aspirations**. DOI: 10.3389/educ.2019.00060. Disponível em: <<https://www.frontiersin.org/articles/10.3389/educ.2019.00060/full>>. Acesso em 02 abr.2023.

MCKINSEY & COMPANY. **Diversity Matters: América Latina**. Disponível em: <<https://www.mckinsey.com/br/our-insights/diversity-matters-america-latina>>. Acesso em 21 fev.2023.

OLIVEIRA, C.L.C. **Mulheres na engenharia brasileira: representatividade, dificuldades e Desafios**. In: 4º Encontro de Ciência e Tecnologia, 2017, Porto Velho, RO, Brasil. Anais ...p. 1-10, 2017. Disponível em: <https://www.even3.com.br/anais/ectfaro/69406-mulheres-na-engenharia-brasileira--representatividade-dificuldades-e-desafios>. Acesso em: 07/04/2023.

OLIVEIRA-SILVA, L.C.; PARREIRA, V.A.D. **Barreiras e enfrentamentos de mulheres em carreiras predominantemente masculinas**. Revista Estudos Feministas v30 n.1. p. 1-14,

2022. DOI: <https://doi.org/10.1590/1806-9584-2022v30n174161>. Disponível em: <https://www.scielo.br/j/ref/a/NQdwYF7s3vDympZ6rzyt8bv/>. Acesso em: 01 fev.2023.

ONU MULHERES. **Business case – perspectivas de gênero e inclusão nas empresas: impactos financeiros e não financeiros**. Disponível em: <http://www.onumulheres.org.br/wp-content/uploads/2021/09/Business-Case_Report-1-Portuguese.pdf>. Acesso em 03 abr.2023.

PACTO GLOBAL – REDE BRASIL. **ESG**. Disponível em: <<https://www.pactoglobal.org.br/pg/esg>>. Acesso em: 15 abr. 2022.

PROJECT MANAGEMENT INSTITUTE [PMI] 2020. **A Case for Diversity – The ROI of inclusion on project teams**. Disponível em: <<https://www.pmi.org/learning/library/case-diversity-teams-11998>>. Acesso em 17 abr.2022.

REUBEN, E; SAPIENZA, P; ZINGALES, L. **How stereotypes impair women’s careers in science**. Proceedings of National Academy of Sciences of the United States of America v11. N.12. p. 4403-4408, 2013. DOI: <https://doi.org/10.1073/pnas.1314788111>. Disponível em: <https://doi.org/10.1073/pnas.1314788111>. Acesso em: 20 abr.2023.

ROCHA, D. **Mulheres em cargos de liderança impulsionam agenda ESG. Entenda**. Disponível em: <<https://investidor.estadao.com.br/comportamento/mulheres-cargos-lideranca-impulsionam-esg>>. Acesso em: 15 abr. 2022.

SALVAGNI, J.; CANABARRO, J. **Mulheres líderes: as desigualdades de gênero, carreira e família nas organizações de trabalho**. Revista de Gestão e Secretariado v6 n.2. p. 88-110, 2015. DOI: <https://doi.org/10.7769/gesec.v6i2.347>. Disponível em: <https://ojs.revistagesec.org.br/secretariado/article/view/347>. Acesso em: 19 abr.2023.

SARAIVA, K. **Fabricando identidades femininas em escolas de engenharia**. Cadernos de Gênero e Engenharia 1 (4): 20-30, 2005. Disponível em: <https://www.researchgate.net/publication/337530543_Fabricando_identidades_femininas_em_escolas_de_engenharia>. Acesso em: 20 abr. 2022.

SILVA; L.V.B et al. **Mulher no canteiro de obras: dificuldades e preconceitos**. Revista Humanidades e Inovação v7 n.19. p. 472-486, 2020. Disponível em: <https://revista.unitins.br/index.php/humanidadesinovacao/article/view/3833>. Acesso em 20 abr.2023.

SPECTOR, P.E. **Psicologia nas organizações**. 3ed. São Paulo. Editora Saraiva: 2010.

TAVARES, G.V; MOREIRA, R. **A inserção das mulheres nas engenharias**. Research, Society and Development v11, n. 13. P. 1-10, 2022. DOI: <http://dx.doi.org/10.33448/rsd-v11i13.34747>. Disponível em: <https://rsdjournal.org/index.php/rsd/article/download/34747/29451/389479>. Acesso em 13 abr.2023.

UNITED NATIONS RESEARCH INSTITUTE FOR SOCIAL DEVELOPMENT [UNRISD]. 2017. From the concrete wall to the glass ceiling to the labyrinth: gendering leadership for transformative change. < From the Concrete Wall to the Glass Ceiling to the Labyrinth: Gendering Leadership for Transformative Change (unrisd.org)>. Acesso em 15 abr.2023.

7. POST-TEXTUAL ELEMENTS

7.1 Acknowledgements

Agradecimento à minha orientadora e a todos os excelentes professores do curso de Gestão de Projetos do MBA USP-ESALQ que contribuíram para o meu desenvolvimento profissional. À minha família e amigos que me apoiaram durante toda a trajetória deste curso, especialmente à minha irmã que não me deixou desistir nos momentos de dificuldade. E por fim, a todas as mulheres, inspiradoras deste trabalho, que lutam todos os dias para conquistar o seu espaço de fala e respeito, não apenas na Engenharia, mas em todas as áreas de atuação. Que nunca nos falte força para seguir atrás dos nossos objetivos (Uma das autoras, 2024).

I would like to thank my advisor and all the excellent professors of the Project Management course at the MBA USP-ESALQ who contributed to my professional development. To my family and friends who supported me throughout this course, especially my sister who didn't let me give up in times of difficulty. And finally, to all the women, inspirers of this work, who fight every day to gain their space for speech and respect, not just in Engineering, but in all areas of activity. May we never lack the strength to pursue our goals (One of the authors, 2024).

7.2 Appendix A

7.2.1 Questionnaire applied to the research participants

1. What is/was the segment of the company in which you worked as an Engineering project leader?
2. What characteristics of the project did you manage?
3. What is your marital status?
 - Single
 - Married
 - Divorced
 - the Widow
4. Do you have children?
 - Yes
 - No
5. Do you find it difficult to balance your career and personal life?
6. Do you understand that the female leadership profile is aligned with the current needs of Engineering project management?
7. Do you understand that it is difficult to reach the leadership of Engineering projects for women who do not have other women in their hierarchical structure?
8. Since women are more educated than men, do you understand that the low choice for the Engineering course is due to the low prospect of career progression?

9. Do you understand that there are difficulties in career development due to the prejudice experienced in operational and field activities?
10. What are the biggest barriers that a woman faces when managing Engineering projects?
11. What actions should companies take to ensure gender equity and representation in these positions?

7.2.2 Questionário aplicado aos participantes da pesquisa

1. Qual é/era o segmento da empresa em que você atuou como líder em projeto de Engenharia?
2. Quais as características do projeto que você gerenciou?
3. Qual o seu estado civil?
 - o Solteira
 - o Casada
 - o Divorciada
 - o Viúva
4. Você possui filhos?
 - o Sim
 - o Não
5. Você encontra dificuldade na conciliação da carreira com vida pessoal?
6. Você entende que o perfil de liderança feminina está alinhado com as necessidades atuais de gestão de projetos de Engenharia?
7. Você entende que há relação dificuldade de chegar à liderança de projetos de Engenharia para mulheres que não possuem em sua estrutura hierárquica outras mulheres?
8. Uma vez que as mulheres são mais escolarizadas que os homens, você entende que a baixa escolha pelo curso de Engenharia se deve ao fato da baixa perspectiva de progressão na carreira?
9. Você entende que existem dificuldades na evolução de carreira em decorrência do preconceito vivenciado em atividades operacionais e de campo?
10. Quais são as maiores barreiras que uma mulher sofre na gestão de projetos de Engenharia?
11. Quais são ações que as empresas devem buscar para assegurar equidade de gênero e representatividade nestas posições?